Eagle DB120 Sound Meter

By G8MNY   (Correction Feb 16)
(8 Bit ASCII graphics use code page 437 or 850, Terminal Font)

The is a simple cheap sound meter.

```
     ____                                        PCB LAYOUT
┌───┴────┴───┐                                ┌─────────────┐
││~~~~~~~~~~││                                │    /~~~\    │
││ \        ││                                │Q12│METER│VR2│
││  \       ││                                │    \___/    │
││__________││ 40dBA-120dBA in 2 ranges       │             │
│        ____│ In built calibrator            │VR1      __  │
│       /~~\ │                                │┌┐ Q5  /~  ~\│
│      │    ││                                │││    │SWITCH│
│       \__/ │                                │││IC   \_  _/│
│        ~~~~│                                │└┘   VR3 ~~  │
│            │                                │             │
│ EAGLE      │                                └┐   ┌───┐   ┌┘
│            │                                 │VR5│   │VR4│
│            │                                 └───┘   └───┘
└────────────┘
```

CIRCUIT

```
 ┌─────┬───┬───┬────2K2───────────────┬──────────┬─<+ve
 │    56K  │   │                      │          │    OPAMP
 │  +  │ │/    │+                     │          │    The TD7120 provides
Mic─┤├─┼─┤Q3  ===                     │         56K   fixed stable gain
 │ 4u7 │ │\e   │33u                  7│ ┌───┐    │    to drive the non the
 │    56K  │   │      Low           2│~\│3 56K   │    linear metering stage.
 │     │  VR2├─)─┬───────o<─2K2──┬───┤TA\  6│    │ +
 │     │  Mic  │14K4           150K  │7120>─┴────)──┤├──3K3─>
 │     │  cal  │ ├───────o       ├───┤  /└─┬─19K─┤+ 10u
 │     │   │   │220R High       +│  5│_/ 1 │    ===
 │     │   │   │ │           10u===   │4  ===3n3 │10u
 └─────┴───┴───┴┬┴───────────────┴────┴────┴─────┴─<
                └──VR1──┬o Cal
                  200R  │    ┌────┬───┬────┬──5K1──<+ve
                       220K  │   33K 33K   │
PREAMPS                 │   3K9   │   │   3K9
The 3 wire electret mic └────┼──┤├┘\ /└┤├──┤
& preamp Q3 is powered        \│    X    │/
from a decoupled rail.       Q2├───┘ └───┤Q1
                             e/│ ASTABLE │\e
VR2 calibrates the mic       └──────┬──────┘
capsule & VR1 calibrates           100R
the astable calibrate             ──┴───<
oscillator Q1&2.
```

```
METER DRIVER                                                oOff
+ve<─────────────┬────┬──────────────────────┬──┐e  ┌──┬──┬─o<───┬──┐
                10K │/                    47u│+  \ /  2K2 ├─oHigh│  │
                 ├──┤Q5                     === ──┬──  │  └─oCal │  │
                _│_ │\e         +10u         │  Q7├────┘  ┌─oBat │  │
                \_/   ├───560R──┬─┤├──┬───┐  │    │       │  oOff│  │
                _│_   ├──┐     +│     │   │  │    │       │      │  │
     D1         \_/ │/e  │     ===10u │   │  │   _│_      │      │  │
  ┌─┤>├─┐        ├──┤Q6 100K    │     │   │  │   /_\'     │     === │+
  │     │      │/   │\   │    ┌─┴─┐   │   │  │    │       │      │ BATT
>─┼─2K2─┼──┬───┤Q4    │  │   _│_ _│_ _│_ _│_ │    │       │      │ PP3
  │     │ 100k │\e    │  │   \_/ /_\ \_/ /_\ │    │       ├───┐  │  │
  └─┤<├─┤  └─────)────)──┤+   │D9 │D8 │D7 │D6│    │      VR3 680R│  │
     D2 │       220R  │ ===   │   │   │   │  │    │      50K  │  │  │
        │        │    │  │10u │   │   │   │  │    │       │   │  │  │
<───────)──────┬─┴────┴┬─┴────)───┴───┴───)──┴────┴───────)───┴──┴──┘
        │  10u===     ===10u  │           │               │
      D3├─┤<├──┴──VR5──┴──────┴───┤>├─────)─────────┬─────┤
        │          5K             D10     │ VR4 33u===  Meter
      D4└─┤>├─────────────────────────────┴──2K─────┴─────┘
```

To get a usable 40dB scale on a meter quite a lot of compression is needed. This circuit uses an AGC approach. Transistors Q4, 5 & 6 from a power amp to drive the double voltage doubler bridge D6-10 rectified load of the meter & also provide AGC with D3 & D4 making an variable input attenuator.

VR5 set the AGC log action & diodes D1 & D2 correct for over compression to get the very linear 40dB scale. VR4 is the main calibrate & VR3 is the battery cal.

See my bul on "Sound Levels dBA dBB dBC".

Why don't U send an interesting bul?

73 de John G8MNY @ GB7CIP